

Bass

**Current Panther Distribution and Habitat Use
A Review of Field Notes
Fall 1999 – Winter 2000**

by

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May 2, 2000

The views expressed in this report do not necessarily reflect those of the FWC, nor does the contractor represent the FWC either officially or unofficially.

Capture Season Summary

December 6, 1999, marked the beginning of the FWC's twentieth year of capturing and monitoring the Florida panther. It was a year for records, including 15 new panthers that were added to the sample (Table 1). Six other panthers were treed for scheduled re-collars and 14 collared panthers were treed accidentally while hunting kittens or by random chance (Table 2). Six additional panthers were treed whose collars had stopped transmitting, and one escaped puma was treed and returned to the Seminole Theme Park, bringing the total to 41 panthers treed in 85 days (Table 2). Our efforts were successful in spite of a record number of collars that malfunctioned, and whose recovery took up 64% of our capture season. During the 85 days of capture effort, 54 days were spent recapturing six priority F1 and Texas females (Table 3). Had these collars been working properly an even greater number of new panthers could have been added to the sample. Because panthers with failed collars are as difficult to catch as those with no collar at all, our catch would be equivalent to 21 new captures in 85 days. This is a number unheard of in the history of panther recovery work in South Florida. Another record was the twelve panther mortalities that occurred from summer 1999 to spring 2000 (Table 4). These mortalities were mitigated somewhat by the birth of five new kittens since December 24th.

The most significant news from this season has been the population expansion in Big Cypress National Preserve south of I-75 and the measurable impact that the introduction of eight Texas females has had on the South Florida panther population as a whole (Tables 5-7). Eight new panthers were captured in the Turner River Unit of Big Cypress, bringing the total number of collared cats in BCNP south of I-75 to 14. Seven other panthers were confirmed by sign. This population had declined to zero at one time. See Appendix for a calendar of capture season events.

Current Verifiable Population Size and Distribution

Everglades National Park

Number of panthers : 6

Five collared panthers: TX105, TX108, 85_{Fx}, 61_{F1}, 94_{F1}. Tracks of one uncollared female have also been seen.

Big Cypress National Preserve south of US41

Number of panthers : 0

Big Cypress National Preserve north of US41, south of I-75

Number of panthers : 21

Fourteen collared panthers: FP23, FP55, TX107, 70_{F1}, 71_{F1}, 79_{F1}, 86_{F2}, 87_{Fx}, 88_{F2}, FP89, 90_{F2}, 91_{F2}, 92_{F2}, 93_{Fx(75)}; and tracks of 7 uncollared panthers and 2 kittens

Big Cypress National Preserve north of I-75 and Big Cypress Seminole Indian Reservation

Number of panthers : 12

Nine collared panthers: FP48, FP49, FP56*, FP67, FP69, 73_{F1} (BC-SIR), FP75 (private land), 77_{Fx}, FP81. An uncollared male has been confirmed by treeing, trail camera, tracks, and sighting from air; an uncollared female juvenile daughter of 73_{F1} has been confirmed by tracks; and a young panther, gender unknown, has been confirmed by pictures at Big Cypress Seminole Locker Plant.

Fakahatchee Strand State Preserve and Picayune State Forest

Number of panthers : 6

Five collared panthers: #83_{Fx}, TX106, FP54, FP57*, FP60, and an uncollared female.

Florida Panther National Wildlife Refuge and Catherine Island

Number of panthers : 6

Four collared panthers: FP32, FP78, 66_{F1} (north of Refuge), FP59, uncollared female (northern Refuge), uncollared female (western Refuge).

OK Slough and adjacent private lands

Number of panthers : 4

Two collared panthers: #65_{F1}, FP82, an uncollared male and an uncollared female.

Outliers

Number of panthers : 7

Catfish Creek: FP62 (male)

Sarasota County: 1 uncollared male

Crew Lands: 1 uncollared male, 1 uncollared female

Caloosahatchee: uncollared panther, confirmed by pictures

Hendry County Prison area: uncollared female

Private land: FP11

Total: 62 panthers (41 collared, 21 uncollared)

** Collar has quit.*

Ranges of some resident males overlap Fakahatchee Strand, Panther Refuge and Bear Island. These males were assigned to a single area to avoid counting them twice.

The above total of 62 panthers represents the highest population that I have been able to verify thus far. It includes collared and uncollared, adult and subadult, part-Texas and pure Florida panthers. It does not include kittens at the den site, nor does it include extrapolations.

The estimate of 30 to 50 Florida panthers that has been quoted so often was fairly accurate until 1997. In fact, prior to the genetic introgression program, I doubt if the population ever reached 50. The population had declined in the southern and southeastern part of its range, but increased slightly in the northeast (BCNP Addition Lands). From 1989–1995 the population seemed to stabilize, and we had most of the animals collared. During the Highway Underpass study, all of the panthers caught on film were collared (Mark Lotz, personal communication). Highway mortality was occurring at about the same rate and in the same areas as in previous years. After 1994, the length of our capture seasons declined, but our captures of uncollared panthers began to increase slightly by 1997 and has increased yearly since then: less effort has yielded more uncollared panthers. This year, with an 85-day capture season, we took a record number of uncollared panthers. There has been an increase in mortality, an increase in denning, and a proportional increase in the results of our capture efforts.

Clearly, the population is beginning to expand and is filling in unoccupied habitat within the existing range. This increase should have occurred long before now if the 80–90% kitten survival rates and high female fecundity posited by former FWC panther project leader David Maehr (1997 p. 99)

and Maehr et al. (2000) were accurate. The estimate of 74 pure Florida panthers offered by Maehr (1997, p. 78) is not defensible, especially since he characterizes the area south of I-75 as being unable to support a breeding population of panthers (Maehr, 1997, p. 107). This means that Maehr's 74 panthers were crowded into an area of badly fragmented Hendry County and the northern portion of Collier County north of I-75. The existence of 74 panthers in this small an area would invalidate Maehr's estimate of one panther per 42 square miles.



Figure 1: Resident male #79_{F1} visits an uncollared female. Panther tracks are frequently used to identify new cats and to estimate population size.

Discussion

Events of the past two years have contradicted published theories and opinions about panther ecology in south Florida. Maeher has stated repeatedly that Big Cypress south of I-75 could not sustain a breeding population of panthers. He has characterized the area as "great raccoon and water moccasin country, but terrible panther habitat. . . The few panthers living in such marginal range are essentially the 'living dead' of the population" (Maeher, 1997, p. 213). He further states that thinning forest cover south of I-75 is the likely explanation. However, the greatest population expansion over the past two years has taken place in this area. Four collared females have raised ten kittens in the past season in this area of Big Cypress. Four of these kittens have already dispersed, and six are near dispersal age. Two of the four females were first-time mothers and raised a total of six kittens. All ten of these kittens are products of genetic introgression (Figure 2).



Figure 2: #88_{F2}, daughter of 70_{F1} and 79_{F1}, poster girl for Big Cypress National Preserve.

Maeher has further postulated that the Caloosahatchee River is a barrier to panthers, forming the northern boundary of an insular containment area (Maeher, 1997). Three collared panthers have crossed the Caloosahatchee in

the past two years, and an uncollared panther whose tracks have been found in Sarasota County may possibly have made the crossing as well.

In light of the current post-introgression expansion in range and numbers, the theory that a wide river and "poor habitat" have limited panther population growth has become insupportable. It seems to me that a more reasonable explanation is lack of population pressure caused by low fecundity of female Florida panthers and diminished kitten survival rates, resulting from years of reproductive isolation and inbreeding. Maehr's criticism of the FWC's genetic introgression program has been based on the assumption that the Florida panther shows no signs of inbreeding depression (Maehr, 1995). However, male Florida panthers are still being captured with no testicles or one testicle. Male panthers with one testicle have proven able to breed, yet undescended testicles and holes in the heart cannot be considered survival characteristics. To date, all male panthers which are products of outbreeding have both testicles fully developed. Female Florida panther reproduction has likewise been problematic. In reviewing my field notes of the past twenty years, I find that a significant number of Florida females have failed to reproduce at all; a number of others have had only one or two litters over a long lifespan; still others have had kittens frequently but raised few if any of them. The remainder have successfully reproduced, keeping the population alive but not expanding. For 16 years, the panther population remained for the most part static, dying out in some areas and increasing slightly in others. In contrast, two Texas females, TX101 and TX107, have given birth to eight kittens and raised all eight to maturity. These kittens have in turn produced a minimum of 20 progeny. Both of these Texas females have received implants to inhibit further reproduction, without which they would no doubt be contributing additional kittens to the population.

Twelve of these Fx crosses are not only occupying what has been characterized by Maehr as poor habitat, but they are raising healthy kittens in it. These kittens are robust, seem wilder, more alert, and display greater vigor and stamina when trying to elude the hounds. The signs of outbreeding depression foreseen by Maehr have not appeared thus far (Maehr, 1998). Reconnecting subspecies genetically is an idea whose time may have come, and other species (e.g., the Mexican grey wolf) could benefit from a similar effort.

The FWC and the individuals involved in genetic restoration deserve credit for recognizing the problem, overcoming the opposition, and implementing the solution. In order to fully realize the significance of the introduction of Texas panthers, just envision the current population without them.

While the debate may go on over forest cover, genetic introgression, and population dynamics of Florida panthers, there is one primary need that is unassailable and cannot be disputed: the preservation of critical habitat directly adjacent to all public lands currently occupied by panthers. One area that is indispensable starts roughly at the Big Cypress Seminole Indian Reservation (BCSIR) and extends west to State Road 29. It lies for the most part south of County Road 846, between Immokalee and BCSIR. Over the past 20 years, a great deal of it has been converted from wild lands into citrus, sugar cane and improved cow pasture. Forty-eight thousand data points of panther telemetry locations cannot be wrong, and many of them lie within this area. It has the highest prey base and the densest cover for panthers, and I am unaware of one single acre of it that has yet been saved. Further studies are unnecessary to establish the need to preserve this critical habitat; the evidence is already overpowering. Action by the FWS is what is needed.

The future of the panther depends on whether the agencies and the public want them badly enough to preserve wild Florida and all that goes with it. No one really knows what constitutes a minimum viable population of panthers, and likewise no one knows how large an area is needed to support them. Yet, just as beavers cut down big trees with little bites, so goes what's left of Florida's wildness. A Daniels Road here, a Daniels Road there, and pretty soon it's gone forever (Figure 3).



Figure 3: Unmindful of the debates over habitat fragmentation and genetic introgression, #70_{F1} kills another deer for her three yearlings in Big Cypress.

Acknowledgments

Our capture efforts this year were assisted in the field by Sonny Bass of ENP and Deborah Jansen of BCNP. They helped us personally and provided necessary helicopter time at their agency's expense. Both of these biologists have played integral roles in the panther project over the past twenty years. Kristen Charlton was our new contract veterinarian for the year. Mark Lotz is a key person on our capture team, and is also very capable in data collection and marking and handling of kittens. As our crew boss, David Shindle has made a big difference in keeping the team organized, and he has shown great patience when captures became difficult.

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Table 1. Newly radio-collared panthers.

Panther	Sex	Capture Date	Age	Birth Date	Parents	Location	Death	Weight (lbs.)
FP80	F	1/14/00	3.5 yrs.	?	?	BCSIR	2/00 vehicle	94
FP81	M	1/14/00	3.5 yrs.	?	?	BCSIR		141
FP82	F	1/25/00	3 yrs.	?	?	OK Slough		125
83 _{F1}	F	2/8/00	8 mos.	5/99	TX106,?	PSSF		50
84 _{Fx}	M	2/11/00	12 mos.	1/99	73 _{F1} ,?	BCSIR	4/00?	95
85 _{Fx}	M	2/17/00	11 mos.	4/99	61 _{F1} ,FP16	ENP		70
86 _{F2}	F	2/21/00	7 mos.	7/99	71 _{F1} ,79 _{F1}	BCNP		36
87 _{Fx}	F	2/25/00	10 mos.	5/99	FP55,79 _{F1}	BCNP		60
88 _{F2}	F	3/2/00	9 mos.	6/99	70 _{F1} ,79 _{F1}	BCNP		56
FP89	M	3/2/00	2.2 yrs.	?	?	BCNP		94
90 _{F2}	M	3/8/00	8 mos.	7/99	71 _{F1} ,79 _{F1}	BCNP		50
91 _{F2}	F	3/17/00	10 mos.	7/99	70 _{F1} ,79 _{F1}	BCNP		55
92 _{F2}	M	4/6/00	11 mos.	6/99	70 _{F1} ,79 _{F1}	BCNP		66
93 _{Fx(75)}	F	4/10/00	11 mos.	5/99	TX107,79 _{F1}	BCNP		63
94 _{F1}	F	5/1/00	10 mos.	7/99	TX105,FP16	ENP		54

Note: *FP* denotes Florida panther; *F1* denotes *FPxTX*; *F2* denotes *F1xF1*; *Fx* denotes other crosses.

Table 2. Allocation of time among capture season tasks.

Tasks	Number of panthers	Capture team days
Scheduled recollars	6	6
Collar malfunctions	6	54
New adults collared	4	3
New juveniles collared	11	14
Kittens marked	5	2
Accidental treeing of collared panthers	14	6*
TOTAL	46	85

* while hunting kittens, at times 2-3 members of a family were treed on the same day.

Table 3. Allocation of capture season days by task / by region.

Region	Total days	Days spent on sched. recollars	Days spent on collar failures	Days spent collaring new cats	Days spent marking kittens	Days spent on misc. tasks
ENP	26		21	4		1
BCNP south of US41						
BCNP north of US41	37		30	7		
BCNP north of I-75	4	2	1			1
FPNWR	5	1			1	3
FSSP	2			2		
BCSIR	7	2	1	3		1
Private land	1				1	
Picayune State Forest	2	1	1			
OK Slough	1			1		
TOTAL	85	6	54	17	2	6

Table 4. Panther mortality
Summer 1999 – Spring 2000

Panther #	Sex	Location	Cause of death
FP80	F	BCSIR	vehicle
84 _{FX}	M	Fisheating Creek	?
FP68	M	BCNP N of I-75	intraspecific aggression?
FP63	M	SR29, Sunniland	vehicle
TX101	F	BCSIR	?
FP76	M	FSSP	intraspecific aggression
FP16	M	ENP	old age ?
kitten of 66 _{F1}		CR858	vehicle
TX103	F	BCNP S of US41	complications of pregnancy
Uncollared	M	McDaniels Ranch	vehicle
Uncollared	F	East of Hendry Co. Prison	vehicle
Uncollared		East of CR846	vehicle

Table 5. Radio-collared Florida panthers.

Panther	Sex	Location	Breeding Status
FP11	F	private land	past breeding age
FP23	F	BCNP S of 75	past breeding age
FP32	F	FPNWR	past breeding age
FP48	F	BCNP N of 75	2 kittens, Fall 99, abandoned
FP49	F	BCNP N of 75	1 M 2/99, fate unknown
FP55	F	BCNP S of 75	3 <i>Fx</i> 's, two raised (1 M, 1 F)
FP56*	F	BCNP N of 75	unknown for 1999
FP57*	F	FSSP	no recent denning history
FP67	F	BCNP N of 75	none yet, long past due (4 years old)
FP69	F	BCNP N of 75	3 kittens, 8/99, 2 sighted from air 5/00
FP75	F	private land	dennded 4/00, abandoned den 5/00
FP78	F	FPNWR	dennded 5/00, 2 kittens
FP82	F	OK Slough	no kittens yet; pregnant at capture?
FP54	M	FPNWR	breeding adult
FP59	M	FPNWR/FSSP	breeding adult
FP60	M	FPNWR	breeding adult
FP62	M	Catfish Creek	breeding age, no known females present
FP81	M	BCSIR	breeding adult
FP89	M	BCNP S of 75	young adult male, status unknown

* Collars have quit.

Table 6. Texas panthers and radio-collared Texas progeny.

Panther	Sex	Location	Breeding Status
61 _{F1}	F	ENP	1 male 3/99, captured 2/00, dispersed 4/00
66* _{F1}	F	private land	3 kittens 12/24: 1 hwy death, 2 with mother
70* _{F1}	F	BCNP S of 75	3 kittens born 6/99, all captured
71 _{F1}	F	BCNP S of 75	4 kittens born 7/99, 3 raised, 2 captured
73 _{F1}	F	BCSIR	2 surviving kittens, 1 captured
77 _{Fx}	F	BCNP N of 75	now breeding age
83 _{F1}	F	PSSF	juvenile captured 2/8/00, still with mother
86 _{F2}	F	BCNP S of 75	juvenile captured 2/2/00, still with mother
87 _{Fx}	F	BCNP S of 75	juvenile captured 2/21/00
88 _{F2}	F	BCNP S of 75	juvenile captured 3/2/00
91 _{F2}	F	BCNP S of 75	juvenile captured 3/17/00
93 _{Fx(75)}	F	BCNP S of 75	juvenile captured 4/10/00, now dispersed
94 _{F1}	F	ENP	juvenile captured 5/1/00
TX105	F	ENP	1 kitten born 5/99, raised; no adult male in home range
TX106	F	PSSF	2 kittens born, 1 raised
TX107	F	BCNP S of 75	3 kittens born, 2 raised; implant
TX108	F	ENP	no adult male in home range
65 _{F1}	M	OK Slough	breeding adult
79 _{F1}	M	BCNP S of 75	breeding adult
85 _{Fx}	M	ENP	juvenile, dispersed
90 _{F2}	M	BCNP S of 75	with mother
92 _{F2}	M	BCNP S of 75	with mother

* Collars have quit.

Table 7. Number of radio-collared panthers in South Florida.

Lineage	Total	Males	Females	Jan 1999 – May 2000	
				Kittens born	Kittens surviving
Florida	19	6	13	8 FP	4 FP
F1(50%)	9	2	7	21 Fx*	17 Fx*
F2(50%)	5	2	3		
Fx(25%)	3	1	2		
Fx(75%)	1		1		
Texas	4		4		
Total Collared	41**	11	30	29	21

* FP55 is the mother of two of these kittens.

** Four collars currently not transmitting.

Appendix

Calendar of Capture Season Events

- **December 14** – TX108 (female) was recaptured because of collar failure on the western side of Long Pine Key (ENP). Her capture weight was 78 lbs., unchanged since her last capture. Nine days were spent in her recapture.
- **December 24** – Den of 66_{F1} was found, with 3 kittens. Den was located on private land north of County Road 858 and north of FPNWR.
- **January 10** – TX101 (female) was recollared, as scheduled, and was given a second implant to inhibit further reproduction. Her capture weight was 118 lbs.

On the same day, panther 73_{F1} (female) was also captured, and her collar was replaced after having fallen off. A third panther was treed, but the veterinarian did not have enough drugs to anesthetize a third panther.

- **January 13** – Captured escaped collared female puma and returned it to holding pen on Big Cypress Seminole Indian Reservation (Figure 4).



Figure 4: Escaped puma.

- **January 14** – Two adult uncollared Florida panthers, FP80 and FP81, were captured and collared. FP80 (female) weighed 94 lbs.; FP81(male) weighed 141 lbs. (Figure 5).



Figure 5: Florida panthers FP80 and FP81.

- **January 17** – FP63 (male) died on State Road 29 near Sunniland. He was first captured on the Big Cypress Seminole Indian Reservation three years ago.
- **January 21** – TX106 (female) was captured for a scheduled recollaring. Her weight was 86 lbs. She ran and treed five times during the capture.
- **January 24** – FP32, a non-breeding female, received a scheduled recollaring in the FPNWR; weight 84 lbs.

- **January 25** – A new female Florida panther, FP82, was captured and collared in OK Slough. Her capture weight was 124 lbs., making her the largest of all females captured so far.
- **January 27** – Female 77_{FX} was treed accidentally in the BCNP Addition Lands north of I-75. She looked robust and healthy.
- **February 1** – FP49 (female) was captured for a scheduled recollaring in the BCNP Addition Lands north of I-75. Her capture weight was 75 lbs., down from 86 lbs. at her previous capture.
- **February 8** – An 8-month-old female panther, 83_{F1}, daughter of TX106, was captured in FSSP. Her capture weight was 50 lbs.
- **February 11** – An 13-month-old male panther, 84_{FX}, son of 73_{F1}, was captured on the BCSIR. His capture weight was 95 lbs. TX101 and 73_{F1} were treed accidentally during the hunt.
- **February 17** – #61_{F1} (female) was captured in ENP to replace a failed collar; capture weight 83 lbs. Twelve days were spent in the recapture effort. Her collar had malfunctioned in April 1999.

A yearling male kitten, 85_{FX}, was also captured, on the east side of Long Pine Key. He is a son of 61_{F1} and FP16. His capture weight was 70 lbs. He dispersed two months after his capture.

- **February 18** – TX105 (female) was treed while searching for kittens (none were found).

- **February 21** – A 7-month-old female kitten, 86_{F2}, daughter of 71_{F1}, was captured in northeast BCNP, south of I-75. Capture weight was 36 lbs. (Figure 6).

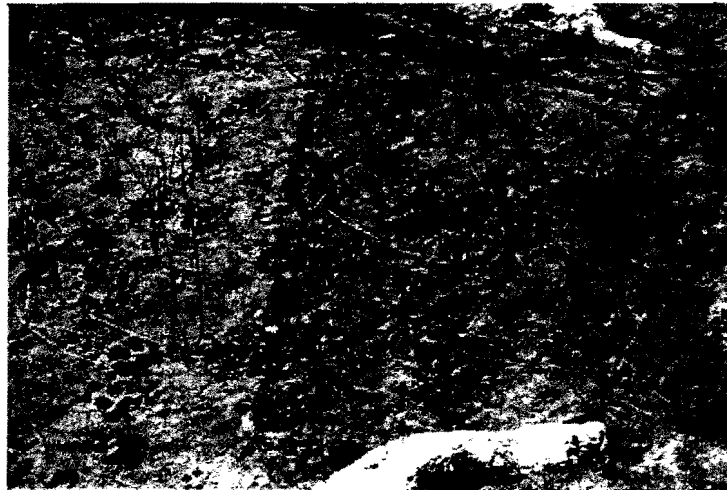
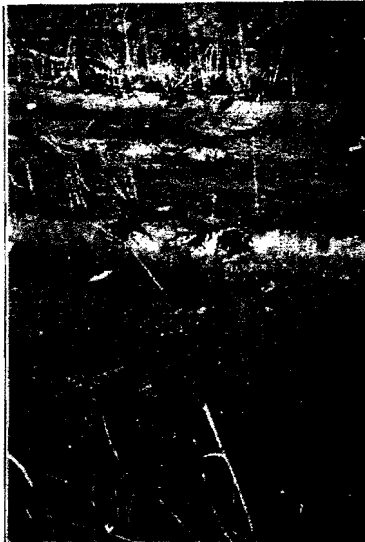


Figure 6: Panther family crosses prairie (top). Kittens at play (bottom). Photos by Deborah Jansen, NPS.

- **February 24** – A second capture of 83_{F1}, daughter of TX106, was necessary when her radio-collar failed after only two weeks. She was captured this time in Picayune Strand State Forest.
- **February 28** – #87_{Fx}, daughter of FP55 and an F1 male, #79, was captured in BCNP north of Monument Lake. Capture weight was 60 lbs. (Figure 7).



Figure 7: Buck deer killed and fed on two nights by FP55 and two yearling panthers.

- March 2 - #88_{F2}, daughter of 70_{F1}, was captured northwest of Skillet Strand, BCNP. Her weight was 56 lbs. (Figure 8).

FP89, a 2.2-year-old male, was captured in the northwestern corner of BCNP. His weight was 94 lbs. This panther was caught by Rocky McBride, a houndsman for Big Cypress National Preserve. FP89 had the characteristic kink, cowlick, and one testicle. His weight was light for his age.



Figure 8: David Shindle and Mark Lotz weighing #88_{F2}, a healthy product of genetic introgression.

- March 3 – FP68, a male Florida panther, died on the BCNP Addition Lands.
- March 8 – #90_{Fx}, son of 71_{F1}, was captured south of the rest area on I-75 in BCNP. Capture weight was 50 lbs. (Figure 9). #71_{F1} and #86_{F2} were treed accidentally during the hunt.



Figure 9: #90_{Fx}, son of F1 female and F1 male (50% Texas).

- March 17 — #91_{Fx}, daughter of 70_{F1}, was captured north of Monument Lake in BCNP. Her weight was 55 lbs. (Figure 10).

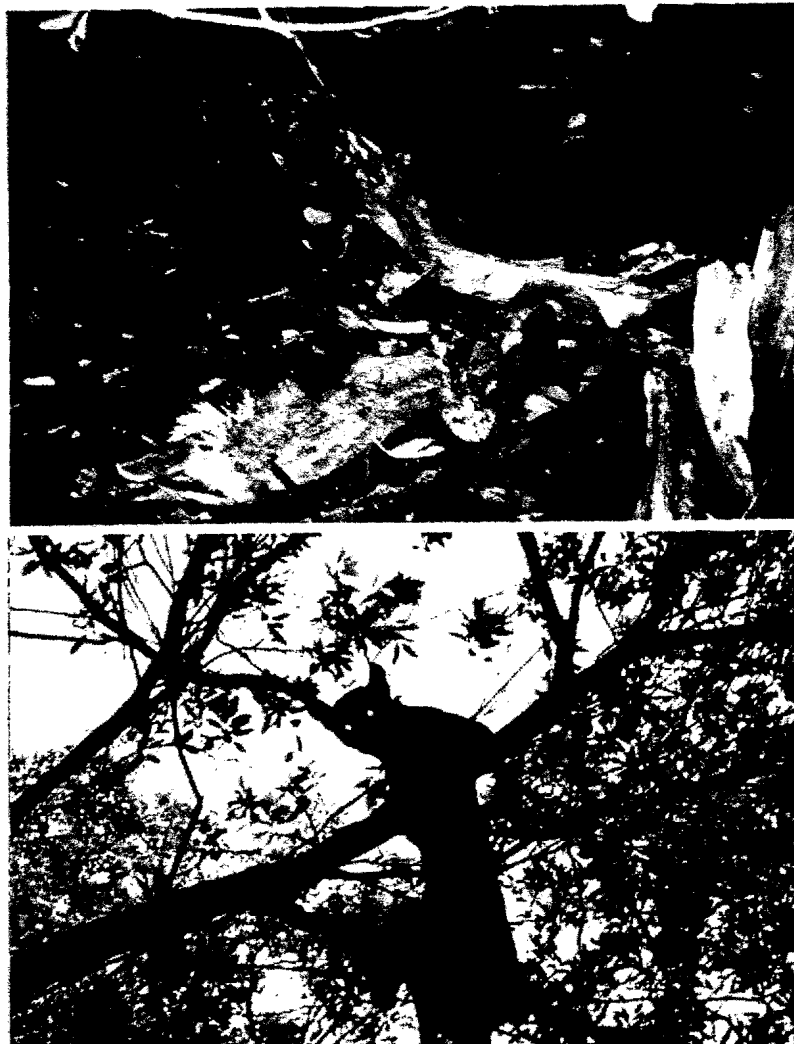


Figure 10: Deer kill, two nights old, fed on by #70_{F1} and three yearlings. An adult deer lasts a panther family of this size for two feedings (top). #91_{Fx}, daughter of 70_{F1} (bottom).

- April 6 – #92_{F2}, son of 70_{F1}, was captured on Concho Billie Trail in BCNP, south of I-75. Weight was 66 lbs. (50% Texas) (Figure 11).



Figure 11: #92_{F2} holds on after darting.

- April 10 – #93_{Fx(75)}, 12-month-old daughter of TX107 and 79_{F1}, was captured in Austin's Camp Strand in BCNP, south of I-75. Weight was 63 lbs. (Figure 12).



Figure 12: #93, daughter of TX107 (75% Texas).

- **April 19** – TX107 was recaptured in Austin's Camp Strand in BCNP. It took 21 days of effort to replace her failed collar (Figure 13).



Figure 13: TX107 (top). Dogs treeing TX107 (bottom).

- **April 26** – FP78 denned with two kittens on FPNWR.
- **May 1** – #94_{F1} daughter of TX105 and male FP16, was collared in ENP. Capture weight was 54 lbs., excellent condition.